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(54) Improvements in or relating to  
containers particularly cups

(57) This invention relates to  
containers, particularly disposable  
drinking cups, which are moulded in  
sheet plastics material and may be  
arranged in a stack with the ingredients  
which form the beverage on the  
addition of water, being prepacked in  
the bases of the cups in the stack. Each  
container has a plastics body the side  
wall of which includes, preferably at a  
point towards the top of the container, a  
gripping ring 17 formed by folding the  
material of the side wall 21 of the cup,  
the gripping ring being separated and  
insulated from the side wall of the cup  
by an annular space 22. Flutes on each  
cup engage a plain portion of an  
adjacent cup frictionally to facilitate  
stacking. A plurality of overlapping  
gripping rings may be provided on each  
cup.

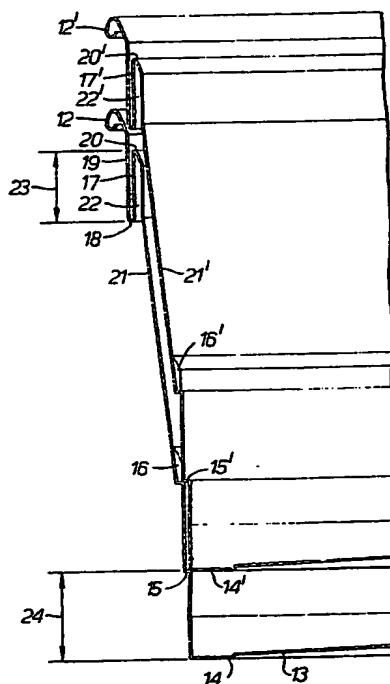


FIG. 2.

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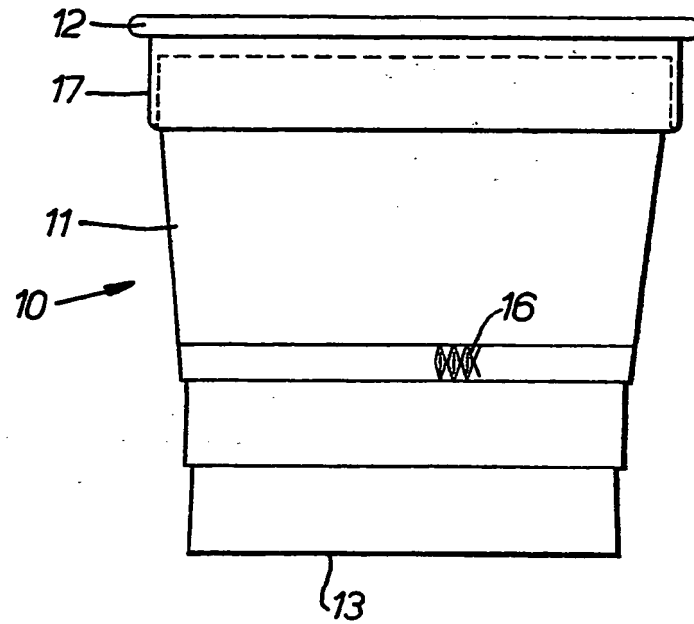


FIG. 1.

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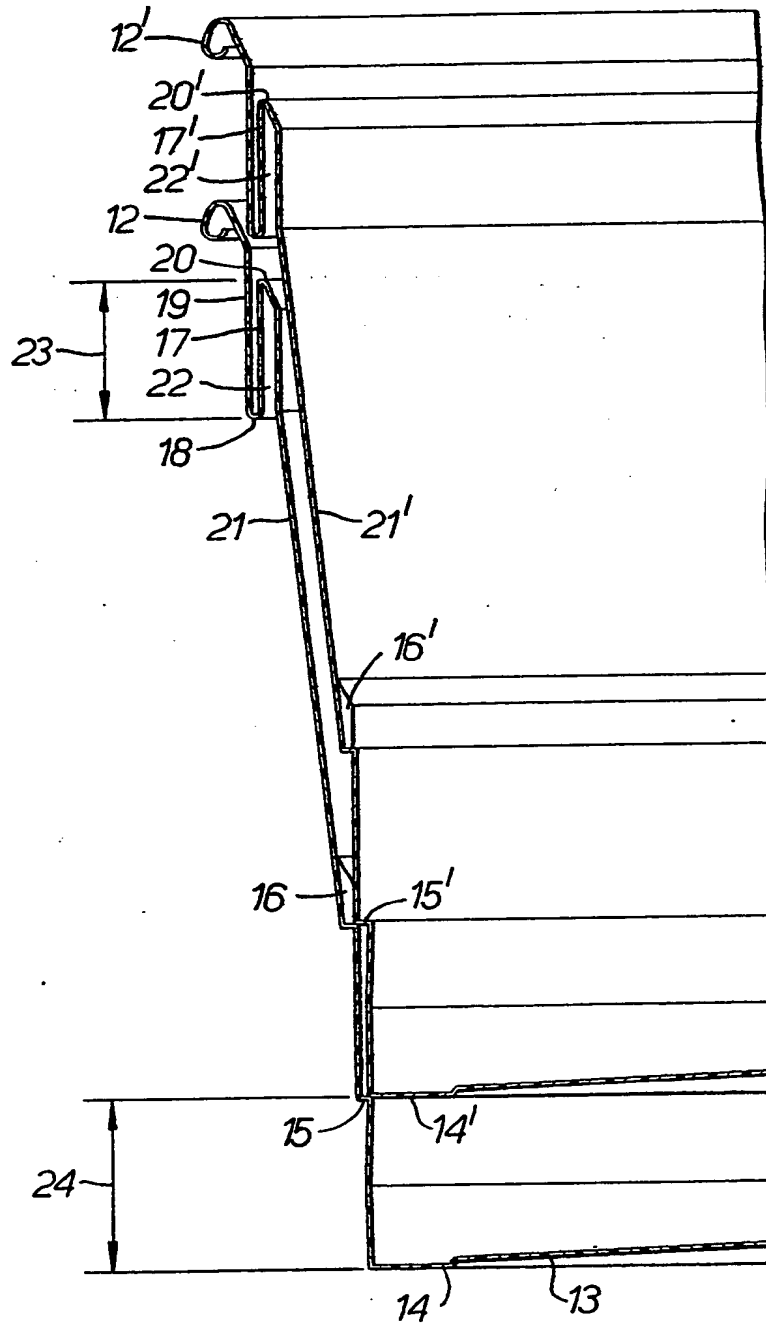


FIG. 2.

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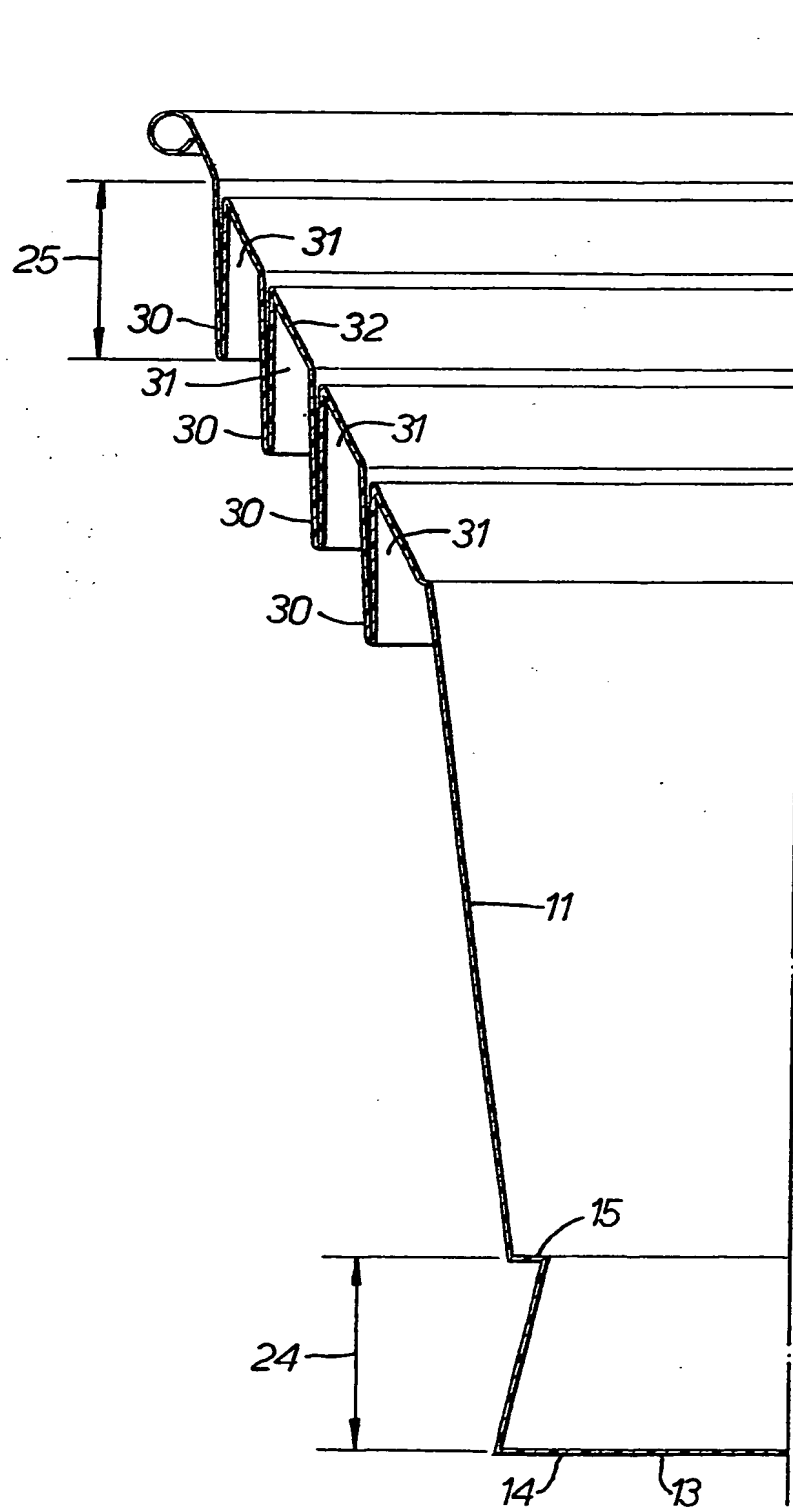


FIG. 3.

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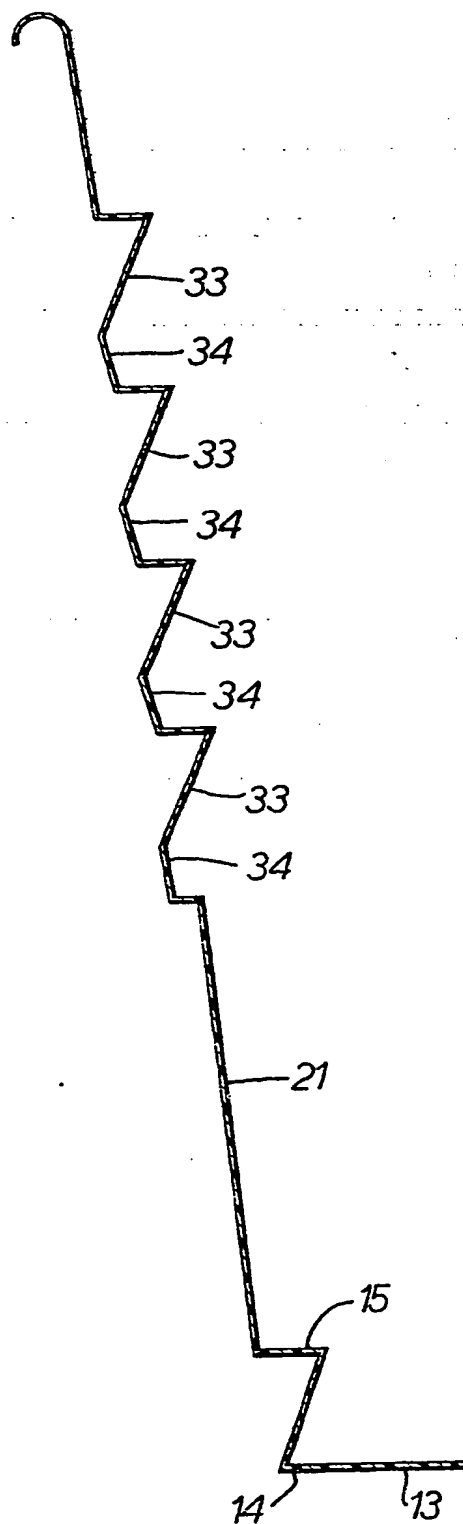


FIG. 4A.

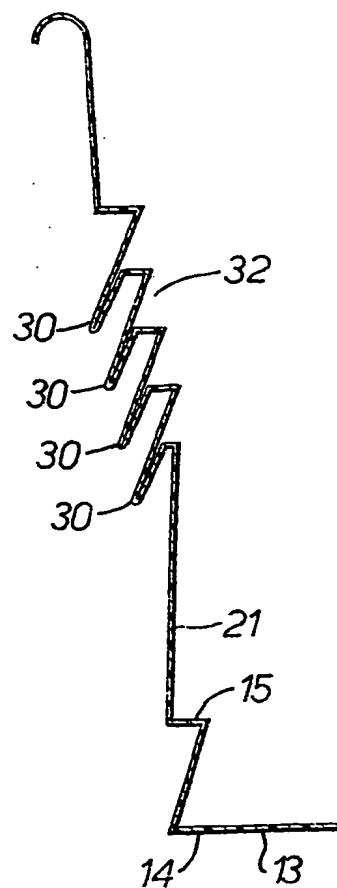


FIG. 4B.

## SPECIFICATION

## Improvements in or relating to containers particularly cups

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This invention relates to containers, particularly disposable drinking cups, which are moulded in sheet plastics material. The containers of the invention find particular application in the consumption and/or sale of beverages, particularly hot beverages, and may be arranged for use in a stack with the ingredients which form the beverage on the addition of water, being pre-packed in the cases of the cups in the stack.

15 The containers may be formed of seamless plastic sheet material, preferably high impact sheet polystyrene.

It is desirable in such containers, particularly when they are used as drinking cups for hot beverages, to provide some means for protecting the hand of a user from the temperature of the contents. In order to achieve this, double walled cups have been proposed but these are expensive both in manufacturing costs and material content. It is an object of the present invention to provide a single walled cup which fulfils these objectives.

Accordingly the present invention provides a container moulded in sheet plastics material having a body the side wall of which includes, preferably at a point towards the top of the container, a gripping ring formed by folding the material of the side wall of the cup, the gripping ring being separated and insulated from the side wall of the cup by an annular space.

35 Preferably the material of the cup is folded upwards about a bottom edge of the gripping ring, extends upwards inside the gripping ring and then is folded downwards again to continue the side wall of the cup.

40 In one arrangement, a cup according to the invention may have a plurality of such gripping rings spaced down the side wall of the cup. Preferably such plurality of gripping rings are arranged to overlap one another.

45 In one embodiment of the invention, the containers are arranged so that they can be stacked together, the container being provided with a lower stacking surface which engages with an upper stacking surface of a further such container so that the bases of a plurality of such containers in a stack are spaced from one another. The space formed between the spaces in such a stack may be used to contain the ingredients of a beverage. Preferably in such an arrangement, the gripping rings are arranged so that they do not interfere with the gripping rings of any further such containers in such a stack.

Preferably the body of the container is generally frusto-conical tapering towards the base of the container.

60 In a further aspect the invention provides a stackable container having a generally frusto-conical

body and a base; which container is formed with a lower stacking surface and an upper stacking surface which surfaces are arranged so that when one such container is stacked inside a further such container the lower stacking surface of the inner container sits on the upper stacking surface of the outer container, and is formed with a series of inwardly directed flutes arranged to frictionally engage a generally plain portion of a further such container stacked therein thus to resist separation of the containers in a stack. Preferably the flutes are disposed slightly above the upper stacking surface.

70 In order to promote a fuller understanding of the above, and other aspects of the present invention, an embodiment will now be described, by way of example only, with reference to the accompanying drawings, in which:

80 Figure 1 shows a side elevation of a cup embodying the invention,

Figure 2 shows in schematic cross-section a pair of cups of Figure 1 in a nesting configuration,

Figure 3 shows in schematic cross-section a further embodiment of the invention, and

85 Figures 4a and 4b show schematically steps in one method by which a cup of the invention may be formed.

Figure 1 shows the side elevation of a cup embodying the invention. The cup is formed from synthetic plastic sheet material, preferably a high impact polystyrene sheet material by the process known as differential pressure thermo-forming.

The cup comprises a body indicated generally at 95 10 having a generally frusto-conical side wall 11 terminating at the top in a rolled rim 12 and at the bottom in a base 13. As best seen in Figure 2 the base has at least a peripheral land 14 which forms a lower stacking surface, and spaced above the land 100 14 the side wall 11 has a shoulder 15 which forms an upper stacking surface. The arrangement is such that when a number of the cups are stacked together, two cups being shown stacked in Figure 2, the land 14 sits on the shoulder 15 to space the cups in the stack 105 so that the bases 13 are separated by a predetermined space which may be utilised to pre-pack the ingredients of a beverage to be produced in the cup. Thus as cups are removed from the stack, the ingredients of the beverage is also in the bottom of the cup ready for the addition of hot water in known fashion *per se*.

The cup is formed at a level spaced above the shoulder 15 with a series of inwardly directed flutes 16 which are arranged to frictionally grip a generally plain portion of a further such cup when it is stacked in the cup as shown in Figure 2, such frictional engagement being just above the shoulder 15 of the next cup in the stack. The frictional engagement of the flute 16 is preferably sufficient to retain the cups in a stack against reasonable separating force, and the provision of flutes as opposed to a continuous inward projection enables the resistance to separation being purely frictional and avoids the formation of a vacuum in the space between the cups which

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

would otherwise resist separation.

When a series of such cups are in a stack, engagement between the land 14 and the shoulder 15 between successive cups provides a seal to protect the ingredients contained in the space between the bases 13 of a series of cups.

Towards the top of the side wall 11, the cup is formed with an insulating gripping ring indicated generally at 17. The gripping ring 17 is formed by folding the material of the side wall of the cup upwards about an edge 18 at the bottom of the ring 17, this best being seen in Figure 2, to lie closely inside what then becomes the outer skin 19 of the ring 17, and then back down again at an angle from an edge 20 towards the top of the gripping ring 19 to blend again into the frusto-conical main portion 21 of the side wall 11, thus leaving an annular space 22 between the gripping ring 19 and the frusto-conical portion 21 of the side wall.

The axial height of the gripping ring 19 as indicated at 23 in Figure 2 is chosen to be less than the axial height of the space between the bases 13 as indicated at 24 in Figure 2, so that when a series of such cups are placed together in a stack with the lands 14 in engagement with the shoulders 15, the gripping rings 19 do not engage with one another so that there is no possibility of them becoming wedged together.

Thus it can be seen that the gripping ring 17 is provided to be separated from the main side wall of the cup by the annular space 22 which affords thermal insulation between the gripping ring 17 and the contents of the cup which may be hot. Thus a user of the cup is offered a gripping portion which may be held comfortably despite the ingredients being quite hot.

Figure 3 shows a modified embodiment in which a series of gripping rings 30 are provided in an axially spaced but overlapping arrangement along a frusto-conical portion 31 of the side wall 11 of a generally similar cup. In other respects the cup of Figure 3 is similar to that of Figures 1 and 2 and similar features are given the same reference numbers.

Figures 4a and 4b show one manner in which the cup of Figure 3 might be formed. As a first step, a series of triangular peripheral grooves are formed as indicated at 33 in Figure 4a, in the portion of the cup which is to form the frusto-conical portion 32. The material of the frusto-conical portion 32 is then axially compressed so that the portions of material 34 indicated in Figure 4a are folded back to lie behind the grooves 33 thus forming the rings 30 as indicated in Figure 4b.

#### CLAIMS

1. A container moulded from sheet plastics material having a body comprising a side wall and a base, the side wall of which includes a gripping ring formed by folding the material of the side wall of the container, the gripping ring being separated and insulated from the side wall of the container by an annular space.

2. A container as claimed in Claim 1, in which the insulating ring is positioned near the top of the container.

3. A drinking cup in the form of a container as

claimed in Claim 1 or 2.

4. A container as claimed in any preceding claim in which the material of the side wall is folded upwards about a bottom edge of the gripping ring, extends upwards inside the gripping ring and then is folded downwards again to continue the side wall of the container.

5. A container as claimed in any one of the preceding claims having a plurality of such gripping rings spaced down the side wall of the container.

6. A container as claimed in Claim 5, in which said gripping rings are each arranged to overlap an adjacent lower gripping ring.

7. A container as claimed in any preceding Claim arranged so that it may be stacked inside a further container.

8. A container as claimed in Claim 7, provided with a lower stacking surface and an upper stacking surface, said stacking surfaces being arranged so that when two such containers are stacked together the lower stacking surface of one engages the upper stacking surface of the other and the bases of the containers are spaced apart.

9. A container as claimed in Claim 7 and 8, in which the gripping rings of the container do not interfere when the containers are stacked.

10. A container as claimed in any preceding Claim in which the side wall is generally frusto-conical in shape tapering towards the base of the container.

11. A stackable container as claimed in any preceding claim in which a part of the side wall is formed with flutes arranged to frictionally engage a generally plain portion of the side wall of a further such container stacked therewith.

12. A stackable container as claimed in Claim 11, in which said flutes are inwardly directed and arranged to engage a generally plain portion of the side wall of a further such container stacked therein.

13. A stackable container as claimed in Claim 11 or 12, as dependant on Claim 8, in which said flutes are disposed above the upper stacking surface.

14. A stack of containers as claimed in any preceding Claim in which the bases are spaced apart and the dry ingredients of a beverage are disposed in the spaces between the bases.

15. A container such as a drinking cup substantially as herein described with reference to the accompanying drawings.

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